ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

Douglas A. Ducey
Governor

Misael Cabrera
Director

via e-mail

April 24, 2019
FPU19-211

Ms. Catherine Jerrard
AFCEC/CIBW
706 Hangar Road
Rome, NY 13441

RE: WAFB – ADEQ information request – ST012 EBR Work Plan Item Updates

Dear Ms. Jerrard:

Arizona Department of Environmental Quality (ADEQ) Federal Projects Unit (FPU) and ADEQ contractor UXO Pro, Inc., are respectfully requesting information updates pertaining to the former Williams Air Force Base (WAFB), Site ST012 enhanced bioremediation (EBR) work plan and also the field variance memoranda (FVM) subsequently submitted. Requested information is detailed below.

Information Request

1. Please provide an updated in-situ biological degradation analyses sampling plan, including collection locations and schedule. Stable-isotope probe (SIP), sulfate reducing bacteria (SRB), and Total Eubacteria (EBAC) should be included as outlined in the Enhanced Bioremediation (EBR) Work Plan.

   The *Final Pilot Study Implementation Work Plan for Operable Unit 2, Revised Groundwater Remedy, Site ST012, Former Williams Air Force Base, Mesa, Arizona* (Work Plan) provides for microbiological parameters analysis following EBR activity start-up. Table 5-1 of the Work Plan identifies the following wells and parameters to monitor populations of sulfate reducing bacteria (SRB) and benzene biodegraders beginning 6-12 months after start of injections "based on field conditions (including sulfate travel time and groundwater temperatures)":

Media	Locations	Monitoring/Analysis
Liquid/BioTraps®	ST012-CZ02 ST012-CZ20 ST012-UWBZ24 ST012-UWBZ31 ST012-LSZ10 ST012-LSZ42	SIP (13^C in PLFA and DIC) SRB (qPCR) EBAC (qPCR)

Appendix J Operational Decision Matrix of the Work Plan identifies similar monitoring parameters with a timeframe of 3-12 months after injection start. Baseline data for SRB and EBAC (Total Eubacteria) were collected from the listed wells in May 2018, but there is no pre-EBR baseline SIP data.

ADEQ notes that raw laboratory data delivery time could be 3 months from the SIP sampler deployment time. A presumptive SIP (stable-isotope probe) analysis requires deployment of stable-isotope-tagged benzene samplers (BioTraps®) in target monitoring wells, where the sampler will incubate for 6 to 7 weeks. Once returned to the Microbial Insights laboratory (via overnight FedEx delivery), data turn-around can takes approximately 6 weeks.

(Please note the Work Plan cites groundwater temperatures as a condition in determining the timing for collecting microbiological data, but temperatures have not been provided to the stakeholders on a regular basis (see comment 6)).

2. Please elaborate upon how FVM#7's injection/extraction changes will impact containment, sulfate distribution, and appropriate locations for microbiological analyses (SIP, SRB, EBAC).

   Section 3.2.2 of the Work Plan states "Updates to the groundwater model will be incorporated in subsequent phases as appropriate when additional data is available." Based on the modifications identified in FVM #7 and subsequent site activities, it would be appropriate to update the model. In addition, the sulfate injections and groundwater extraction sequencing has been modified somewhat as a result of pump maintenance and repair activities. Subsequent modifications to the groundwater monitoring program may be required based on results of the updated model.

3. Please provide an updated *extraction-as-containment* plan as the EBR pilot study proceeds. For example, when will extraction in wells solely for containment be terminated? Section 6 of FVM #5 states "The [containment] extraction system would then operate until EBR can be implemented or alternate decision is made. The phase 1 EBR implementation design anticipated only 1-2 weeks of operation (i.e. groundwater extraction) before initiation of sulfate injections."

4. Please provide a table showing the current injection/extraction wells, cumulative volume injected/extracted, and individual extraction pumping rates.

5. Please compare the laboratory sulfate analyses results and the field test kit screening results.

6. Please update field parameter measurement tables. The most recent data was submitted in September 2018 for groundwater sampling conducted through August 2018.

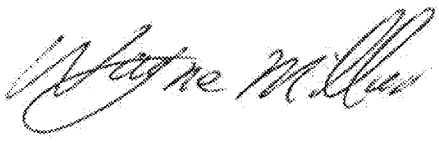
7. Please update preliminary groundwater analytical result tables. The most recent submittal was dated June 2018 for baseline sampling conducted in April and May 2018.

8. Please update the quarterly monitoring program identified in Work Plan Table 5-1 and FVM#5's Table 4-1.
   a. Provide the schedule for quarterly sampling of injection and extraction wells.
   b. Identify any changes in the listed wells as a result of FVM #7 and subsequent injection sequencing changes.

Closure

Thank you for the opportunity to request information. Should you have any questions regarding this correspondence, please contact me by phone at (602) 771-4121 or e-mail miller.wayne@azdeq.gov.

Sincerely,



Wayne Miller
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cc:

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